



**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

Form PTO-1449 (Modified)
(Use several sheets if necessary)

#5

COMPLETE IF KNOWN

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

Sheet	1	of	7
-------	---	----	---

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent or Application		Name of Patentee or Inventor of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Figures Appear
		NUMBER	Kind Code (if known)			
lll.		09/738,551		Morrissey et al.	01/03/02	
		09/900,710		Dordi et al.	04/18/02	
		3,267,010		Creutz et al.	08/16/66	
		3,328,273		Creutz et al.	06/27/67	
		*3,664,933		Clauss	05/23/72	
		3,770,598		Creutz et al.	11/06/73	
		*3,716,462		Jensen	02/1973	
		*3,878,066		Dettke et al.	04/1975	
		*3,930,963		Polichette et al.	01/06/75	
		*4,000,046		Weaver	12/28/76	
		*4,134,802		Herr	01/16/79	
		4,272,335		Combs	06/09/81	
		4,279,948		Kukanskis et al.	07/21/81	
		*4,576,689		Makkaev et al.	03/18/86	
		4,624,749		Black et al.	11/25/86	
		*4,959,278		Shimauchi et al.	09/25/90	
		4,990,224		Mahmoud	02/05/91	
		5,021,129		Arbach et al.	06/04/91	
		*5,115,430		Hirai et al.	05/19/92	
		*5,151,168		Gilton et al.	09/29/92	
		*5,209,817		Ahmed et al.	05/11/93	
		5,284,548		Carey et al.	02/08/94	
		*5,372,848		Blackwell et al.	12/13/94	
		5,409,587		Sandhu et al.	04/25/95	
		5,443,865		Tisdale et al.	08/22/95	
lll.		*5,472,502		Lowery	12/05/95	

RECEIVED
DEC 23 2003
TC 1700 MAIL ROOM

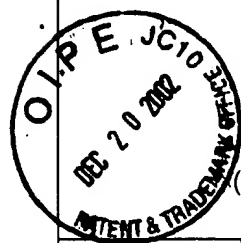
EXAMINER

lll. & lll.

DATE CONSIDERED

11/3/03

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**Form PTO-1449 (Modified)
(Use several sheets if necessary)**COMPLETE IF KNOWN**

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

Sheet	2	of	7
-------	---	----	---

U.S. PATENT DOCUMENTS

	U.S. Patent or Application			
44.	5,482,891	Shieh et al.	01/09/96	
	*5,549,808	Farooq et al.	08/27/96	
	5,576,052	Arledge et al.	11/19/96	
	*5,639,316	Cabral, Jr. et al.	06/17/97	
	5,674,787	Zhao et al.	10/07/97	
	5,695,810	Dubin et al.	12/09/97	
	5,719,447	Gardner	02/17/98	
	5,723,387	Chen	03/03/98	
	5,730,854	Martin	03/24/98	
	5,824,599	Schacham-Diamand et al.	10/20/98	
	*5,882,498	Dubin et al.	03/16/99	
	5,891,513	Dubin et al.	04/06/99	
	5,897,368	Cole, Jr. et al.	04/27/99	
	*5,908,543	Matsunami et al.	06/01/99	
	5,913,147	Dubin et al.	06/15/99	
	*5,932,077	Reynolds	08/03/99	
	5,969,422	Ting et al.	10/19/99	
	5,972,192	Dubin et al.	10/26/99	
	*6,036,836	Peeters et al.	03/14/00	
	6,065,424	Schacham-Diamand et al.	05/23/00	
	6,069,068	Rathore et al.	05/30/00	
	*6,113,771	Landau et al.	09/05/00	
	6,197,688	Simpson	03/06/01	
	6,197,181	Chen	03/06/01	
✓	6,309,524	Woodruff et al.	10/30/01	
44.	6,319,831	Tsai et al.	11/20/01	

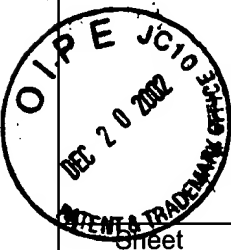
RECEIVED
DEC 23 2003
TC 1700 MAIL ROOM

EXAMINER

DATE CONSIDERED

11/3/03

*EXAMINER: Initial reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).



**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
Form PTO-1449 (Modified)
(Use several sheets if necessary)

COMPLETE IF KNOWN

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

RECEIVED
DEC 23 2003
JC100 MAIL ROOM

U.S. PATENT DOCUMENTS

U.S. Patent or Application

FOREIGN PATENT DOCUMENTS

Examiner Initial	Cite No.	Foreign Patent or Application			Name of Patentee or Applicant of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Figures Appear	T
		Office	NUMBER	Kind Code (if known)				
UV.		GB	2 285 174 A		Mitsubishi Denki Kabushiki Kaisha	12/15/94		
		JP	52-16433		Furukawa Electric Co.	07/30/75		
UV.		JP	5-142262		Oki Electric Co.	06/14/93		
UV.		WO	99/47731		Semitool, Inc.	09/23/99		

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published.	T
UV.		ALI, HASSAN O. et al., "A Review of Electroless Gold Deposition Processes," Gold Bull (1984) pp. 118-127, 17, (4) *	
		BENEDETTI, A.V. et al., "Electrochemical Studies of Copper, Copper-Aluminum and Copper-Aluminum-Silver Alloys: Impedance Results in 0.5M NaCl," Electrochimica Acta (March 1995) pp. 000, Vol. 40, Great Britain	
		BINDRA, PERMINDER et al., "Fundamental Aspects of Electroless Copper Plating," Electroless Plating Fundamentals & Applications (January 1990) pp. 289-375, Noyes Data Corporation/Noyes Publications	
UV.		DESPIC, ALEKSANDAR R., "Deposition and Dissolution of Metals and Alloys, Part B: Mechanisms, Kinetics, Texture, and Morphology," Comprehensive Treatise of Electrochemistry Vol. 7: Kinetics and Mechanisms of Electrode Processes (1983) pp. 451-527, Plenum Press, New York and London *	

* No Month avail.

EXAMINER 	DATE CONSIDERED 11/3/03
*EXAMINER: Initial reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**Form PTO-1449 (Modified)
(Use several sheets if necessary)**COMPLETE IF KNOWN**

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

RECEIVED
DEC 23 2003
JC100 MAIL ROOM

Sheet 4 of 7

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published.	T
LL.		DESILVA, MELVIN J. et al., "A Novel Seed Layer Scheme to Protect Catalytic Surfaces for Electroless Deposition," J. Electrochem. Soc. (November 1996) pp. 3512-3516, Vol. 143, No. 11	
		DUBIN, V.M. et al., "Copper Plating Techniques For ULSI Metallization," Advanced Metallization and Interconnect Systems for ULSI Application in 1997: Materials Research Society Symposium Proceedings, (January 1998) pp. 405-411, Materials Research Society, Warrendale	
		DUBIN, V. et al., "Copper Electroplating for On-chip Metallization," 11 pgs, Advanced Micro Devices, Sunnyvale **	
		DUBIN, V.M. et al., "Sub-Half Micron Electroless Cu Metallization," Materials Research Society Symposium Proceedings, (January 1996) pp. 179-184, Vol. 427, Materials Research Society	
		DUBIN, V.M. et al., "Selective and Blanket Electroless Copper Deposition for Ultralarge Scale Integration," J. Electrochem. Soc. (March 1997) pp. 898-908, Vol. 144, No. 3, The Electrochemical Society, Inc., Pennington, NJ	
		FUJINAMI, T. et al., "Electroless Copper Plating on PZT Ceramic," Plating & Surface Finishing (May 1998) pp. 100-104	
		GABE, D.R., "Principles of Metal Surface Treatment and Protection," Second Edition (1978), Chapters 1, 2, and 8, 198 pgs, Pergamon Press, Great Britain *	
		GIGNAC, L.M. et al., "Characterization of Plated Cu Thin Film Microstructures," Material Research Society Symposium Proceedings Vol. 564: Advanced Interconnects and Contacts (April 1999) pp. 373-434, Materials Research Society, Warrendale	
LL.		KANG, S. et al., "Relationship Between Texture and Surface Morphology of Copper Electrodeposits," Plating & Surface Finishing (October 1995) pp. 67-70	

* No month avail.

* No date avail.

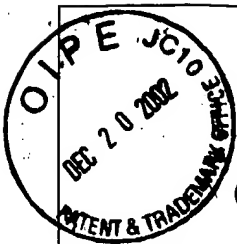
EXAMINER

Wesley

DATE CONSIDERED

11/3/03

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).



**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

Form PTO-1449 (Modified)
(Use several sheets if necessary)

COMPLETE IF KNOWN

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

RECEIVED
DEC 23 2003
TC 1100 MAIL ROOM

Sheet 5 of 7

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published.	T
UV.		KELLY, J.J. et al., "Copper Deposition in the Presence of Polyethylene Glycol: I. Quartz Crystal Microbalance Study," J. Electrochem. Soc. (October 1998) pp. 3472-3481, Vol. 145, No. 10, The Electrochemical Society, Inc.	
		KHERA, R.P., "The Basic Principles of Electrolytic Deposition," pp. 69-84 * *	
		KRISHNAN, R.M. et al., "Electroplating of Copper from a Non-cyanide Electrolyte," Plating & Surface Finishing (July 1995) pp. 56-59, Vol. 82, No. 7	
		KRÖGER, R. et al., "Properties of Copper Films Prepared by Chemical Vapor Deposition for Advanced Metallization of Microelectronic Devices," Journal of the Electrochemical Society (1999) pp. 3248-3254, Vol. 146, No. 9 *	
		LOPATIN, S. et al., "Electroless Cu and Barrier Layers for Sub-Half Micron Multilevel Interconnects," Multilevel Interconnect Technology, Conference 3214, SPIE (October 1997) pp. 21-32, Vol. 3214	
		LOPATIN, S. et al., "Extendibility of Ion-Metal Plasma and Electroplating Technologies for Damascene-Based Copper Metallization," 7 pgs, Advanced Micro Devices, Sunnyvale * *	
		LOPATIN, S. et al., "Conformal Electroless Copper Deposition For Sub - 0.5 µm Interconnect Wiring of Very High Aspect Ratio," Proceedings of the Third Symposium on Electrochemically Deposited Thin Films (1997) pp. 271-288, Vol. 96-19, The Electrochemical Society, Inc., Pennington *	
		LOWENHEIM, F.A. et al. (Eds.), "Gold" Modern Electroplating, Third Edition (1974) pp. 224-244, John Wiley * Sons, Inc., New York *	
		LOWENHEIM, F.A. et al. (Eds.), "Electroless Plating," Modern Electroplating, Third Edition (1974) pp. 710-747, John Wile & Sons, Inc., New York *	
4k.		MURARKA, S.P. et al., "Copper Metallization for ULSI and Beyond," Critical * Reviews in Solid State and Materials Sciences (1995) pp. 87-124, Vol. 20, No. 2	

* No month avail

* * No date avail

EXAMINER

Wesley [Signature]

DATE CONSIDERED

11/3/03

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).



INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

Form PTO-1449 (Modified)
(Use several sheets if necessary)

COMPLETE IF KNOWN

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

Sheet 6 of 7

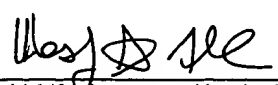
RECEIVED
DEC 23 2003
TE 1700 MAIL ROOM

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published.	T
UQ.		MURARKA, S.P. "Metallization: Theory and Practice for VLSI and ULSI," 256 pgs (1993) Reed Publishing (USA) *	
		NOBE, K., "Electrodissolution Kinetics of Metals and Alloys," (date?) 17 pgs, Department of Chemical Engineering, University of California, Los Angeles **	
		OSKAM, G. et al., "Electrochemical Deposition of Copper on a n-Si/TiN," Journal of The Electrochemical Society (1999) pp. 1436-1441, Vol. 146, No. 4 *	
		PALMANS R., et al., "Development of An Electroless Copper Deposition Bath For Via Fill Applications on Tin Seed Layers," Advanced Metallization for ULSI Applications in 1994: Materials Research Society Symposium Proceedings, (January 1995) pp. 87-94 Materials Research Society, Pittsburgh	
		REID, J.D. et al., "Impedance Behavior of a Sulfuric Acid-Cupric Sulfate/Copper Cathode Interface," J. Electrochem Society: Electrochemical Science and Technology (June 1987) pp. 1389-1394, Vol. 134, No. 6	
		SATO, N., "Toward a More Fundamental Understanding of Corrosion Processes," Corrosion (May 1989) pp. 354-367, Vol. 45, No. 5	
		SCHLESINGER, M. et al. (Eds.), "Electrodeposition of Gold," Modern Electroplating, Fourth Edition (2000) pp. 201-225, John Wiley & Sons, Inc. (USA) *	
		SCHLESINGER, M. et al., "Electroless Deposition of Nickel," Modern Electroplating, Fourth Edition (2000) pp. 667-684 John Wiley & Sons, Inc. (USA) *	
		SHACHAM-DIAMAND, Y., "Electroless Copper for Micropackaging and Ultralarge-Scale Integrated Circuit Applications," Materials for Electronic Packaging (1995) pp. 221-240, Butterworth-Heinemann, Newton *	
UQ.		SHACHAM-DIAMAND, Y. et al., "Electroless Copper Deposition for ULSI," Thin Solid Films 262 (1995) pp. 93-103 *	

* No Date avail.

** No date avail

EXAMINER 	DATE CONSIDERED 10/3/03
*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).	



**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
Form PTO-1449 (Modified)
(Use several sheets if necessary)

COMPLETE IF KNOWN

Application Number	09/885,232
Confirmation Number	4989
Filing Date	06/20/2001
First Named Inventor	LinLin Chen
Group Art Unit	1741
Examiner Name	Unknown
Attorney Docket No.	29195-8163US2

RECEIVED
DEC 23 2003
JC10 MAIL ROOM

Sheet 7 of 7

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published.	T
44 -		SHACHAM-DIAMAND, Y. et al., "0.35 μ m Cu-Filled Via Holes By Blanket Deposited Electroless Copper on Sputtered Seed Layer," 3 pgs, SEMATECH, Austin **	
		SMY, T. et al., "Simulation of Electroless Deposition of Cu Thin Films for Very Large Scale Integration Metallization," Journal of The Electrochemical Society (June 1997), pp. 2115-2122, Vol. 144, No. 6, The Electrochemical Society, Inc.	
		STEIGERWALD, J.M. et al., "Electrochemical Potential Measurements during the Chemical-Mechanical Polishing of Copper Thin Films," Journal of the Electrochemical Society (July 1995) pp. 2379-2385, Vol. 142, No. 7, The Electrochemical Society, Inc.	
		TAYLOR, T. et al., "Electrolyte Composition Monitoring For Copper Interconnect Applications," Presented at 193 rd Meeting of the Electrochemical Society, 26 pgs, Semitool, Inc. Kalispell **	
		WÜNSCHE, M. et al., "Morphology and Stability of Electrochemically Generated Copper Layers: The Effect of Electron Transfer and Nucleation Kinetics," Circuit World (1996) pp. 4-9, Vol. 22, No. 3 *	
		YOSHIKI, H. et al., "Adhesion Mechanism of Electroless Copper Film Formed on Ceramic Substrates Using ZnO Thin Film as an Intermediate Layer," J. Electrochem. Soc. (May 1998) pp. 1430-1434, Vol. 145, No. 5, The Electrochemical Society, Inc.	
		YUNG, E.K. et al., "Fundamental Study of Acid Copper Through-Hole Electroplating Process," J. Electrochem. Soc. (March 1989) pp. 756-767, Vol. 136, No. 3, The Electrochemical Society, Inc.	
		YUNG, E.K. et al., "Plating of Copper into Through-Holes and Vias," J. Electrochem. So. (January 1989) pp. 206-215, Vol. 136, No. 1, The Electrochemical Society, Inc.	
44 -		L'Augmentation Du Courant Limite Par Les Differentes Formes D'Electrodes, 20 pgs **	

* No Month avail

** No Date avail

EXAMINER 	DATE CONSIDERED 11/3/03
*EXAMINER: Initial reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).	